ing the flow of calcium across the plasma membrane of the cell. Although the molecular basis of regulating calcium release from intracellular organelles is known, the mechanism regulating calcium flow across the plasma membrane has been a mystery.

In 1991, Putney and his collaborators in the NIEHS Laboratory of Cellular and Molecular Pharmacology published circumstantial evidence that a signal is somehow sent to the plasma membrane from the endoplasmic reticulum of cells, which activates the plasma membrane calcium inflow mechanism. Putney and Gary S. Bird, also of NIEHS, have found evidence that a small regulatory protein, called a G-protein, plays some obligatory role in this regulatory mechanism signaling. The specific G-protein involved has not been identified yet, but Putney finds it interesting that the genes coding for a number of these small G-proteins have been shown to be precursors for oncogenes.

The two *Nature* reports provide the first direct evidence for the small, diffusible messenger molecule that Putney's earlier work predicted. In keeping with Putney's findings, this small messenger could be a small G-protein, or it could be an even smaller molecule.

Says Putney, "These findings may herald the advent of a new era of intracellular endocrinology. This may involve signaling pathways occurring in the cytoplasm of cells with a complexity similar to that of the well-characterized endocrine system at the organism level. Clearly, an understanding of this cytoplasmic endocrinology will provide new insights into the cellular actions of hormones and growth factors, as well as cellular toxins."

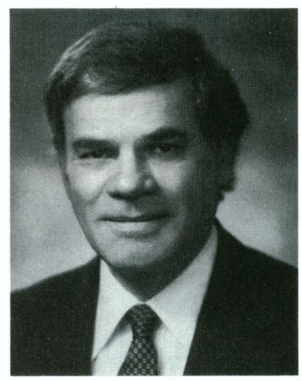
NTP Expands Mission through Grants

The National Toxicology Program, established in 1978, coordinates toxicological studies within the Department of Health and Human Services. Although much of NTP's visibility has been tied to its two-year rat and mice studies as well as other, short-term studies, NTP has always had a vigorous program to develop new, better, and more rapid ways to study toxicity. Until recently, this research was done by NIEHS staff or through contractors, but now NTP is expanding by using the NIEHS grant program to bring university and other scientists outside government into the NTP effort.

The first NIEHS/NTP initiative using the grant mechanism was announced in the October 29 issue of the *NIH Guide for Grants and Contracts*. A request for applications titled, "Toxic Substance Effects on Developmental Gene Expression," was announced to stimulate research into how environmental agents alter the basic process of development and contribute to birth defects in humans. When awarded, these will be the first grants specifically designed to fulfill the NTP mission.

This particular request for applications is the outgrowth of a series of workshops on molecular and cellular mechanisms of early mammalian development that was sponsored by NIEHS. The workshops provided a forum in which developmental biologists reviewed and discussed advances in their basic research field with genetic toxicologists, developmental toxicologists/teratologists, and human embryologists/fetal pathologists to provide a framework whereby these advances might be applied to an understanding of abnormal development and to further identify and prioritize key research areas. A major recommendation from these workshops was that progress in understanding the etiologies and pathogenesis of abnormal development would be vastly improved through continued communication between developmental biologists and developmental toxicologists via collaborative initiatives.

A research grant was considered to be the best vehicle to accomplish this goal and at the same time provide data relevant to the goals of the NTP. It is expected to be the first in a series of NIEHS/ NTP-sponsored requests for applications and program announcements that may cover other areas of interest to the NTP, including, for example, carcinogenicity, immunotoxicity, neurotoxicity, and pulmonary toxicity.


NIEHS

Martin Rodbell.

NAPE to Study Effect of Air Pollution on Organ Systems

The National Association of Physicians for the Environment has received support from NIEHS to initiate a program on the impacts of air pollution on body organs and systems. The program is to include a preconference meeting, a national conference, development of a document, and preparation of a physician and public education program on specific health effects including those on the brain and neurological system, ears, nose, throat, taste, smell, sinuses, gastrointestinal tract, lungs, blood, bone, kidneys, liver, heart, skin, and bladder. Emphasis will be placed on populations at significant risk, including minority populations in the inner cities, children, and seniors. Indoor air pollution will be included in the study.

Each of the interested medical specialty orgnizations is being invited to prepare, before the conference, a peer-reviewed chapter on specific organs and systems. These chapters will be compiled to develop the document, which will be widely circulated in the medical community.

For information on this effort, contact G. Richard Holt, c/o NAPE, 6410 Rockledge Drive, Suite 203, Bethesda, MD 20817-1809; (301) 571-9791, FAX (301) 530-8910.

Rodbell Receives Honor

At its 213th annual meeting, the American Academy of Arts and Sciences elected 195 new members, among them Martin Rodbell, chief of the Signal Transduction Section in the Laboratory of Cellular and Molecular Pharmacology at the NIEHS. Rodbell is internationally recognized for his discoveries regarding the proteins and mechanisms that mediate cell surface receptors of light, hormones, and a variety of chemical signals. The proteins are important both to cellular communication in plants and animals and to the development of a number of diseases. These transducers are related both in structure and function to cancer-linked oncogenes.

The academy, which includes more than 3800 fellows and foreign honorary members, was founded in 1780 by John Adams and other leaders of the new republic. It is an honorary society and interdisciplinary studies center that includes scholars and national leaders in four categories: mathematics and physical sciences; biological sciences; social arts and sciences; and the humanities. The academy conducts interdisciplinary studies of current public, social, and intellectual issues and sponsors conferences and seminars that bring together scholars and leaders whose research, experience, or knowledge can help to clarify contemporary problems and place them in perspective.